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Regional and Innovation Policies in Finland – Towards Convergence and/or Mismatch?

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JAUHIAINEN, J. (2007) Regional and Innovation Policies in Finland – Towards Convergence and/or Mismatch?, Regional Studies, 41, 000–000. This article discusses regional and innovation policies in Finland, with special attention focused on centres of expertise, regional centres and Multipolis programmes. Traditionally, regional policy in Finland supports populating of the entire country by providing equal access to welfare regardless of local resources. Current innovation-oriented regional policies promote larger urban areas by integrating them as regional clusters into the national innovation system while promoting necessary innovation-supportive interaction within localities, and by opening development into a global economy. Simultaneous implementation of the goals of the traditional distributive welfare policy and new competitiveness policies easily leads to a policy mismatch at the local level.

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INTRODUCTION

The European Union (EU) is struggling to reach the goals of the Lisbon strategy: to become the world's most competitive area by 2010. In February 2005, the European Commission led by José Manuel Barroso stressed the importance of employment growth and productivity rise in the EU. The Commission insisted that investment in research and development, a well-functioning education policy, high technologies, innovations and strengthening of the common market are necessary for a more competitive EU, member states and regions (EUROPEAN COMMISSION, 2005).

The EU progresses slowly in implementing competitiveness strategies, but in several international evaluations Finland appears as the world's most competitive country. For example, the World Economic Forum (2005) ranked Finland 1st in information society, 1st in innovation, research and development, 1st in liberalisation, 1st in network industries, 1st in enterprise environment, 1st in sustainable development, 2nd in financial services and 3rd in social inclusion among the EU countries. Nevertheless, Finland is a small country in terms of population (5.3 million inhabitants, i.e. 1.1 % of the EU27) and economic resources (GDP 157,200 million euros, i.e. 1.5 % of the EU27). Furthermore, Finland places among the lowest of the OECD countries in attracting foreign direct investments (12,467 million euros) (OECD, 2005, 26).

Finland has a national strategy to organise an information society that includes production and use of high technology. The policies support a vision of a comprehensive

information society that territorially encompasses the whole country and its population (*SCIENCE*…, 2000; 2006; *INFORMATION*…, 2005). The Finnish innovation policy follows the definition of an innovation policy given by Lundvall & Borràs (1997, 37): promoting the development, diffusion and efficient use of new products, services and processes in markets and inside private and public organisations. For example, mobile phone penetration was very rapid already in the 1990s, and today over 90 percent of the population are mobile phone subscribers and over half use the Internet (ITU, 2006). However, there have also been challenges in the recent years. The explosion of the 'Internet bubble' in 2000 ended the rapid progress in employment growth in the information and communication technologies (ICT), and Finland is not among the top countries in broadband distribution. In addition, the OECD (2005, 70) indicates that the use of ICT by SMEs "falls far short of the image of Finland as a leading 'Information Society' country." Nevertheless, Finland has met many of the criteria of the Lisbon strategy. The EC target of investing three percent of the national GDP into R&D by 2010 was reached in Finland already in 2000, and it was 3.4 percent in 2005 – with the notable contribution of Nokia (STATISTICS FINLAND, 2006a).

In this article I discuss the development of regional and innovation policies in Finland. Firstly, I synthesise the evolution of the nationally designed regional policy and innovation policy until today. I argue that the regional and innovation policies were separate earlier, but since the 1990s, following the national authorities' focus on high technology, globalisation and competitiveness in economic policies, they have been converging. As empirical material I use regional development legislation in Finland

between 1966 and 2006, key documents of the Science and Technology Policy Council in 1990, 2000, 2003 and 2006, as well as earlier scientific reviews of the Finnish regional and innovation policies.

Secondly, I discuss the on-going regionalisation of the national innovation policy and the integration of innovation into the regional policy. As empirical examples I use the Centres of Expertise Programme, the Regional Centres Development Programme, and the Multipolis project. The traditional regional policy aims to maintain the whole country of Finland populated through a balanced regional structure that provides opportunities for welfare and growth regardless of the location (REGIONAL DEVELOPMENT ACT, 2002). These equal opportunities are also stressed in recent information society policies (*SCIENCE*…, 2006). However, at the same time the contemporary (innovation) policy aims to raise the competitiveness of large urban agglomerations, based on regional specialisation, clustering of economic activities and internationalisation (MINISTRY OF THE INTERIOR, 2004). There is a challenge in the integration of these two. Thirdly, I use northern Finland and the Multipolis high technology network as an example of controversies encountered in integrating regional and innovation policies in Finland. Finally, I raise issues regarding both the Finnish and international debates on regional and innovation policy evolution.

SUCCESS OF REGIONAL AND INNOVATION POLICIES

Several scholars in the 1980s (see FREEMAN, 1991; LUNDVALL, 1992; NELSON, 1993) elaborated the concepts of innovation systems, i.e. how interaction leads to innovations over space. In the beginning, an innovation system meant the innovative capacity of national production systems. Such a nationally bounded innovation system was localised and promoted valuable capabilities and framework conditions not available to competitors abroad. In the early 1990s, globalisation and the need to enhance competitiveness turned the attention of national governments towards systematic understanding and applied use of innovation systems. It was possible to enhance national competitiveness by identifying and enhancing the core of the national innovation system, i.e. nationally specific interaction between the structure and institutions (LUNDVALL & MASKELL, 2000, 364). The European Commission and many countries were attracted by these observations and formulated their policies accordingly.

In the EU's structural policies for 2007–2013, significant is to improve local and regional competitiveness through innovations (HÜBNER, 2005). Regional and innovation policies are crucial for reaching the goals of the Lisbon strategy and for successful regional development. According to Lorenzen (2001, 164), regional development is dependent on localised and interconnected processes of technological development (innovation) and evolution of a range of social institutions (institutional learning). The ability to organise endogenous learning processes and create favourable resonance structures for policy learning determines the competitiveness of regions (BENZ & FÜRST, 2002, 22).

Evolutionary economics is increasingly used to conceptualise and organise regional development by stimulating the diffusion of innovations and the emergence of behavioural and institutional variety in an economic system. Important are traditional structural development parameters, such as the composition of the production structure, the size and knowledge level of the labour force, demand for certain goods and services, the efficiency of market institutions and an efficient system of fiscal and non-fiscal government regulations, but also dynamic relations between economic actors and their environment. Development is a trajectory between 'path dependency' and 'selection', referring to a local environment that channels new variety, enabling or constraining favourable conditions for change. Constraining practices are inherited regional structures, institutions and ideas that do not enable necessary changes. To prevent negative development lock-ins, selections need to be made. However, these selections are often based on trial and error, because in the current globalisation context the success of regional development policies cannot be guaranteed. Nevertheless, a regional policy is more likely to be successful when its policy objects are strongly embedded in the surrounding environment (LAMBOOY & BOSCHMA, 2001, 115–128).

Innovation has taken a fundamental role in organising regional development. Innovation is the basis for obtaining competitiveness by firms, regions and nations. Innovations bring new opportunities to a territory in which innovation takes place or is implemented. Several approaches explain the territorial features of innovation, such as innovative milieu, industrial district, regional innovation system and new industrial spaces. These

approaches share the importance of innovation in regional development, but differ in estimating the role of firms, institutions and other actors in the emergence of innovation and the regional organisation of innovation. Some see institutions as enabling, others as constraining. Regarding R&D, some underline the volume of investment, others interactivity and learning (MOULAERT & NUSSBAUMER, 2005).

Under globalisation, the private sector and public authorities have to focus on keeping not yet ubiquitous, immobile, localised capabilities and networking these capabilities successfully (LUNDVALL & MASKELL 2000, 364). From the spatial perspective, several innovation systems co-exist in the same area. Production, transfer and application of knowledge are crucial for innovation systems, whether mostly at the supranational, national or regional level. Systematic enhancement of such knowledge is conducted through innovation policies. According to Cooke (2004, 2–3), a regional innovation policy promotes the emergence and development of new products and innovative enterprises in a certain territory. Interaction between actors and agents of innovation is highly embedded, exclusive, and localised. It relies heavily on network modulation in a milieu in which vibrant and active social capital exists. Production and efficient use of intellectual capital is an intangible and reproducible resource, which fundamentally depends on social capital. Therefore, regions and networks between developers and users of innovations are fundamental, and regionalisation of a national innovation system and policy is needed to foster innovations in regional development. Based on evolutionary economics, Lambooy & Boschma (2001, 124–128) argue that recommendable policies allow a variety of development paths that connect various parts

of innovation systems to stimulate learning and innovation. Embedding of policy objects in the surrounding environment is important, because when local strategies deviate considerably from the local context, the risk of policy failures increases.

According to Asheim & Gertler (2005, 298–308), regional aspects in innovation systems can be viewed from three perspectives. Firstly, there is regionalised national innovation system, which is functionally integrated in a national or a supranational innovation system. It means clustering of large enterprises' or governmental research institutes' R&D laboratories in planned science parks, often near traditional universities and universities of applied sciences. Secondly, there is a territorially embedded innovation system based on interaction within a particular region. Firms base their innovation activity on localised learning processes stimulated by proximity in geographical, social and cultural aspects, but not much on interaction with knowledge organisations. Thirdly, there is regionally networked innovation system in which interactively learning enterprises and organisations are embedded in a specific region. Regardless of the differences in these three perspectives of the role of territorial inputs and outputs of innovation, a combination of knowledge generation and exploitation is seen as a necessity for commercially viable innovations, which in the long run generate growth. An advantage for the emergence of commercially viable innovations is a shared vision and networking between key agents, such as scientists, engineers, entrepreneurs and venture capitalists. Supportive public and private sector co-operation is often significant in generating existing and new knowledge. Publicly-funded research organisations possess a highly absorptive financial capacity and have a broader emphasis on basic

research, whereas many leading specialised applied research centres are private. For knowledge exploitation as well, significant is a combination of the public and private spheres, which creates an institutional structure for innovations that arranges patenting, licensing, spinout, incubation, financing and swift stock market flotation and allows the active presence of venture capitalists (COOKE, 2004, 2–3).

In Finland, success in the above-mentioned ranking lists for global information society, innovation and competitive economy does not mean that such success is territorially even. The past ten years have witnessed particular growth in the population and employment of the largest urban agglomerations, whereas the countryside and the peripheral eastern and northern regions have declined. Polarisation of the regional GDP per capita has increased, and in 2001 only three regions were above average (OECD, 2005, 14–20). The earlier regional convergence measured with the regional GDP per capita changed into divergence during the deep recession and the recovery from it in the 1990s (PEKKALA, 2000; KAUPPINEN & KARHU, 2002, 276). In addition, regional differences in R&D are over seven-fold, with the Helsinki region plays an overwhelming role. There are notable regional differences in higher education, as well. For example, the share of the population aged 25–54 years with a university degree is 39 percent (total 230,000) in the Uusimaa region close to Helsinki and 24 percent (total 8,000) in the north-eastern region of Kainuu (OECD, 2005, 14–20). Furthermore, universities in the Helsinki region have a much higher scientific impact than elsewhere. To summarise, Finland is not as harmonious and equally developed a country as is often presented.

One key strategy in Finland is to pay more attention to the regional level in organising the knowledge-intensive society (*SCIENCE*…, 2003; 2006). Embedded regional specificities and untradable interdependencies within innovation-developing networks are capabilities not yet available to enterprises outside the regions. According to evolutionary economics, achieving an innovation in one enterprise or institution does not diminish the possibilities of other enterprises or institutions to reach innovations (KRUGMAN, 1998). Spreading the emergence of innovations spatially would create more even regional development while raising national competitiveness. However, achieving such balanced and even regional development is challenging even in Finland. The possibilities of policies depend not only on the current economic context, but also on the trajectory of trials and errors in past regional and innovation policies. Therefore, a careful analysis of the policy trajectory is necessary.

REGIONAL AND INNOVATION POLICIES IN FINLAND

Early regional and innovation policies until the late 1980s

Regional policy is a rather old phenomenon in Finland. Already before the Second World War there was a plan to use natural and human resources efficiently in terms of the whole country. The immediate post-war development of regional policy was influenced by geopolitics. Besides economy, it was politically important that the whole country, including the peripheral eastern borderland and northern Finland towards the

Soviet Union, would be populated. The state promoted this expansion of human activities to less developed areas and unified the country and its population. Agriculture, including forestry, was supported by arranging small farms for war veterans, refugees from ceded Karelia and others. Another method was to establish state-owned mass-production factories in less developed areas, which had a labour force and natural resources available. The key was to develop export-oriented industries (KEKKONEN, 1952). Later expansion of the welfare society created public sector employment in peripheral municipalities and regional centres. Additional regional policy support was targeted to declining rural areas. This was to prevent radicalisation of the inhabitants of rural areas, i.e. their turning into supporters of the growing Communist Party.

In 1960 the labour force was equally divided between agriculture, industry and services, but soon people started to move on a massive scale to industrialising towns: from the north to southern Finland and Sweden. An institutional regional policy was started in 1966 when the first regional development legislation was approved by the Parliament, which was motivated to constrain migration and to help less developed areas through investment and tax exemptions. During the first (1966), the second (1970) and partially the third (1975) period of regional development legislation, regional policy was a matter of regional subsidy transfers and of supporting national economic growth by means of industrial location policy – the latter influenced by the then common growth pole policy (VARTIAINEN, 1998; PEKKALA, 2000). In addition, the functional central place theory was applied to organise service, administration and the transport network. Since 1975 one can really talk about regional policy in Finland with comprehensive goals for

the whole country (HAUTAMÄKI, 1999, 2–3). Large-scale industrialisation of peripheral regions was the goal, where local employment was created in factories, in subcontracting industries and in additional services for the new population. State ownership of mass-production manufacturing allowed such policy implementation. Legislation specified the objectives and procedures of regional policy, the responsibilities of different authorities, implementation of planning procedures, and measures for implementing the projects in different administrative sectors.

Regional policies in Finland were designed with an eye on the policy practices of Finland's more developed neighbour, Sweden. However, the situation started to change in the latter 1970s and early 1980s due to the differing economic context. The fourth law (1981) brought some decentralisation in regional development decision-making and investments, as well a focus on a variety of policy tools for qualitative change in the regions. However, despite the need for restructuring, the strategies of concentration prevailed in industrial policy. Regional policy was part of the national economic policy, and the national government promoted balanced regional development through it. The economic structure of regions was taken into account in the allotment of subsidies. The fifth law (1988) stressed the importance of equality in regional development. About half of the population lived in an area covered by regional subsidies. Information society was mentioned for the first time in this context. Gradually, more emphasis was placed on small and medium-sized enterprises, development by projects and renewing the national economic structure (VARTIAINEN, 1998; HAUTAMÄKI, 1999, 3–4; PEKKALA, 2000). However, substantial changes took place only in the early 1990s.

Compared with the regional policy, the innovation policy is a newer phenomenon. The current national innovation policy in Finland can be traced to the science and technology policy (STP) initiated during the 1960s when, according to the key scholar of the Finnish STP, Lemola (2003, 78), the machinery of the innovation policy was quantitatively expanded. Lemola (2004, 271–272), has found five elements that promoted STP in the early years. Firstly, higher education was developed and regionalised from the late 1950s until the 1970s. This signified the establishment of several new universities, including that of Oulu, today the second largest. Secondly, in 1963 the science policy council was established, which later became the Science and Technology Policy Council. This council is fundamental in national innovation matters today, especially in their political dimension. Thirdly, in 1967 the Finnish National Fund for Research and Development Sitra was founded to promote industry-related STP. Sitra is today the major funding and supporting authority for technology-related research and debate. Fourthly, a reform of national scientific funding was conducted at the turn of the 1970s. Namely, the new Academy of Finland was established and the old Academy, which was less controlled by the national authorities, was dismantled. This led to more direct involvement of national education policy in scientific research. Fifth, a policy doctrine was published in the first STP programmes in the early 1970s. The emphasis on basic research in STP changed into technology orientation already in the early 1980s. This was facilitated by the founding of the National Technology Agency Tekes (later the Finnish Funding Agency for Technology and Innovation) in 1983, the most important funding authority for applied technology development. However, until the late 1980s, the aim was to create a

framework for STP to increase investment and internationalisation in R&D, especially in microelectronics and information technologies (LEMOLA, 2003, 78).

Transformation of regional and innovation policies during the 1990s

Internationalisation and globalisation significantly influenced regional and innovation policies in the 1990s. The evolution of the Finnish regional innovation policy is linked to major macro-economic changes and EU accession. In the past 20 years Finland has changed from a rather closed society with a national economy to an economically open country with advanced technology. The roots of this change are in the late 1980s, when the national government relaxed the national financial policy and true internationalisation started (SKURNIK, 2005). Soon after that Finland's major trading partner, the Soviet Union, collapsed and other major export partners declined, leading into a deep economic recession in Finland, with unemployment over 17 percent. In 1990–1993 the national GDP fell by 9.5 percent (KANGASHARJU & PEKKALA, 2004, 256). Necessary economic restructuring and a strong currency devaluation in the early 1990s led to a fast recovery and growth in labour productivity in the latter 1990s. The latter was facilitated by the rise of the ICT cluster, whose competitiveness was improved by the early opening of national competition in ICT and the launching of technology-supporting higher education programs in the 1980s (OECD, 2005, 9–10).

In 1990 the Science and Technology Policy Council in Finland led by the Prime Minister published the *Review 1990 – Guidelines for Science and Technology policy in the 1990s*

for the new STP (*SCIENCE*…, 1990). This fundamental document was based on a review of the contemporary findings and paradigms of evolutionary economics in which innovations were the core for development – to stimulate the development and diffusion of innovation in the national economic system (see LAMBOOY & BOSCHMA, 2001, 119). According to Lemola (2003, 84; 2004, 273–274), the review influenced the conscious organisation of the national innovation system. The key policy and programme designers and makers fostered the role of R&D and higher education for industrial and economic development. The result was a systematic identification of the key features of the Finnish innovation system: development and utilisation of new knowledge and know-how (aggregate factors), a national research system (targeting higher education), a supportive atmosphere for innovations (facilitating co-operation and interaction between the key actors), and internationalisation (enhancing simultaneous national creation of innovations).

The formation and direction of a national innovation policy and national innovation system are well evident in the policy statements of national governments. Accordingly, innovation, technology, competitiveness of the nation, knowledge-based development and flexibility were mentioned as keywords of the government policy statement a few times in the late 1980s. These keywords came into politics from the main internationalising technology, paper and metal enterprises in Finland, including Nokia and (Stora) Enso. In addition, in the early 1990s the national government and the key stakeholders in economic policy organised training courses for decision-makers in which contemporary innovation-related theories, practices and policies were analysed. By the

early 2000s, these keywords became common in national government policy statements (KANTOLA, 2006).

Although the national innovation system was the core of early policies, ideas were almost simultaneously presented for regionalising the knowledge-intensive society by supporting regional centres of expertise, which would become globally competitive through specialisation in technology (PAASIVIRTA, 1991). Government promotion of regional strategies targeted towards a knowledge-intensive society facilitated the penetration of innovation-related issues into a nationally designed regional policy (LEMOLA, 2004). The national government 1991–1995 mentioned regional competitiveness in its policy statement. Soon two major stakeholders in the Finnish economy, Sitra and the Research Institute of the Finnish Economy Etla, commissioned an extended project on the competitive advantage of industrial clusters in Finland. In 1993 this regionally focused cluster framework was adopted in the *National Industrial Policy for Finland* (MINISTRY OF TRADE AND INDUSTRY, 1993). There were nine clusters, of which the ICT sector was one (HERNESNIEMI *ET AL.*, 1996). The role of Michael Porter's (1990) famous book, *The Competitive Advantage of Nations*, was significant to the design of this cluster policy. Later the cluster approach was used to design the Finnish innovation system, and Porter visited the country, as well. Lemola (2003, 87) states that it was the national government that decided to allocate research funding to support the development of national industrial cluster programmes. This improved co-operation between cluster members, increased knowledge flow, spill-over and networking, and deepened the co-operation between and within public and private

sector agents involved in industrial clusters and innovation activities (PENTIKÄINEN, 2000). Later this "triple helix" model, i.e. active co-operation between national government policies, universities and enterprises was fostered and the national innovation policy strengthened the competitiveness of national clusters (PRIHTI *ET AL.*, 2000).

As indicated, internal pressure towards an economically more accountable regional policy came from the deep economic recession the country experienced in the early 1990s. Public investment in regional development was diminished and inefficient transfer of subsidies was altered. The sixth regional development law (1994) changed the principles of the national regional policy. After a long period of centrally designed regional growth principles driven by passive state investment , endogenous regional development and innovation-driven development emerged, indicating a paradigm shift (OECD, 2005, 43). Beneficial development was to be achieved through locally initiated projects implemented with the programming principle. Two regional policy goals were still traditional, namely development of living conditions and ensuring the availability of basic services everywhere in Finland and expansion of the infrastructure necessary for regional development. The remaining aspects were new: renewal of regional production structures, improvement of companies' operating conditions and job creation, and strengthening of regional economies and the skills of the local population (AALBU *ET AL.*, 1999, 30). In addition, from then on innovations, technology development, competence improvement and competitiveness have been ordinary regional policy keywords.

External pressure towards a national regional policy came from the need to adopt the EU standards before Finland joined the EU in 1995. The main responsibility in formulating a regional development strategy, i.e. a long-term regional plan, programme and implementation, was transferred to new 19 regional authorities consisting of unions of local authorities, in addition to the autonomous Åland islands. The ability of these regions to carry out strategic tasks associated with the innovation policy improved. The fundaments of such an innovation-based regional policy were to increase knowledge and competencies, innovations, new technologies, and related education and training. These were combined with the traditional regional policy goal of maintaining the whole country populated. It resulted in a programme-based policy to strengthen the competitiveness and learning capacity of every region (VARTIAINEN, 1998; HAUTAMÄKI, 1999, 6–7; PEKKALA, 2000, 15). The devolution of power from the former state provinces was not comprehensive, because in 1997 the national government established for different regions altogether 15 Regional Economic and Employment Development Centres, which were responsible to various ministries. These centres became significant gatekeepers of national and EU funding for the regions.

From the perspective of the innovation policy, Finland's joining the EU took place at a moment when innovativeness was strengthened in the EU's regional and structural policies. Furthermore, urban areas and networks were acknowledged as promoters of economic and employment growth at the European level (EUROPEAN COMMISSION, 1995; 1998). This led to more careful attention to urban areas and urban policies in

Finnish regional development – a topic not implemented so far (OECD, 2005, 49–57). The globally early attempt to unify traditional industrial policy and separate science and technology policies into one united national innovation policy in Finland helped in dissociating from the negative inherited lock-ins of low-tech mass production, agriculture and passive regional policies that the country had experienced so far. Therefore, the current position of Finland among the advanced technological countries is at least partly a result of the national government policies, despite Miettinen's (2002) claim that it was also a coincidence, especially the enormous success of Nokia. Nevertheless, as a result of this technology-promoting transformation, the value of industrial production grew by 50 percent in 1995–2000, while the sector's employment growth was 8 percent (STATISTICS FINLAND, 2006a). In 2004 the ICT sector accounted for 20.6 percent of the national export value, or about 10 percent of the GDP, of which 4 percent by Nokia alone (YLÄ-ANTTILA, 2005, 8). High technology became a topic frequently discussed in the media and most often related to business with Nokia mobile phones (JAUHIAINEN, 2007).

Current issues in regional and innovation policies

Today the Finnish innovation policy is based on a national innovation system divided between the public, private and non-governmental sectors (Figure 1). The most important public actor formulating the institutional innovation system and innovation policy is the national government. The Science and Technology Policy Council, led by the Prime Minister, is significant in issues of policy content. Obviously, the Parliament

with its political parties is important due to its legislative powers. The most important ministries linked to the innovation policy are the Ministry of Education, the Ministry of Trade and Industry and the Ministry of the Interior, but other ministries are involved, as well. Crucial public technology and research financing institutions are the National Agency for Technology and Innovation Tekes, the Finnish National Fund for Research and Development Sitra and the Academy of Finland. Other organisations, such as the Finnvera funding agency, play a minor role. The key actors in creating innovations and implementing innovation policies are universities, universities of applied sciences and research institutes, including the State Technical Research Centre VTT. In the private sector one finds scientific associations, private foundations, research institutes, large and small enterprises (including the key actor, Nokia) and other corporate agents, such as venture capitalists involved in R&D. At the local level there are municipalities, technology and science parks, business parks and incubators that implement regional and innovation policy programmes. According to Miettinen (2002), in the Finnish context, the national innovation system relates to both academic research and the applied innovation policy implemented through the triple helix approach mentioned earlier. The OECD (2005, 58) also states that the triple helix interaction model contributed to the rapid penetration of the national innovation system into practice. Formulation of a national innovation policy in Finland has been very pragmatic (LEMOLA, 2003, 90).

Figure 1. National innovation system in Finland.

Knowledge, learning, expertise, research and innovation are seen as crucial to Finland's competitiveness, so they continue to be emphasised in the national innovation system (*SCIENCE…*, 2003, 20–21). In a small country, formalised scientific knowledge does not constitute the most important source of economic growth (LUNDVALL & MASKELL, 2000). Recently, there has been increasing emphasis in Finland on understanding innovations as social processes. Innovations are influenced by a broad societal network consisting of national and regional R&D organisations, education organisations, funding authorities and venture capitalists, technology transfer, politics and habits, costumes, routines, laws, etc. Important is the interaction between these innovation actors.

In the early 2000s two major issues concerned the Finnish national innovation system: its broadening into social innovations and its regionalisation (*SCIENCE…*, 2000; *SCIENCE…*, 2003; *INFORMATION…*, 2005). The Finnish innovation system is comprehensive, but political and even practical decision-making is still strongly concentrated. Most key public actors are located in the Helsinki region. The Prime Minister's Office (2004) has also noted the disparity between innovation organisations. Attention is paid to networking between the key agents in innovation and also on co-ordinating policies with direct or indirect influence on the national innovation system (LIEVONEN & LEMOLA, 2004, 55). Nevertheless, regionalisation of the innovation system and policy has not been addressed, despite the heated political debate on the regional reorganisation of technology agencies and funding in the early 2000s. Regionalisation of some innovation system actors, such as universities of applied

sciences, university centres and other research institutions has started. This fosters functional integration of regionally based clusters into the national innovation system. This is what Asheim & Gertler (2005) call a regionalised national innovation system.

Lundvall & Maskell (2000, 365) point out that the state facilitates accumulation, reproduction and protection of valuable social capital that is fundamental for the comparative advantage of nations and sub-national regions. Due to limited financial and material resources in Finland, the national innovation system concentrates on activities in which the necessary volume and quality can be reached. Besides techn(olog)ical innovations, the Science and Technology Policy Council includes social innovations – without defining them – into the current core of the national innovation policy (*SCIENCE…*, 2003). Another key actor, SITRA, launched a "Social innovations, renewal capacity of the society and economic success: towards the learning society" project in 2002. This project defines social innovation as "those reforms of regulation (laws, authorities), politics and organisational structures and models of action that enhance the performance of society". The economic and social success of a society is seen as being dependent on its capacity to implement structural reforms, which derive from the mental and cultural abilities of the society to be reformed. This enhancing of national capabilities can be economic or social (HÄMÄLÄINEN & HEISKALA, 2004, 10–11). Nevertheless, the main actors in product innovations are enterprises, which achieve innovations in interaction with society. Despite the strong state guidance in innovation and technology development, over two-thirds (69.1 %) of total R&D investments in Finland are carried out by private enterprises and one third alone by a

single enterprise, Nokia (STATISTICS FINLAND, 2006a). However, in the early 2000s globalisation has become an increasingly significant reference in the Finnish innovation and regional policies, in their strategies and practical implementation, as well as due to out-sourcing of various innovation-related activities from Finland to abroad.

CONVERGENCE AND/OR MISMATCH OF REGIONAL AND POLICIES IN FINLAND

In recent years there have been attempts to discover the speciality of the Finnish way of making an innovation policy. In fact, Manuel Castells has become a regular guest at several formal and informal meetings regarding the topic in Finland. As a result, Castells and Himanen (2001) named this significant support for comprehensive and distributive knowledge-based social policy the "welfare information society". However, on the other side of this policy is the aim to make Finland globally the most competitive economy. Obviously, macroeconomic policies matter here, but so does the regionalisation of the innovation policy. To that end the national government and regions have started to promote larger competitive urban agglomerations through various regional and innovation policy instruments. This attention to urban agglomerations and innovations was facilitated by Richard Florida (2002), another key expert whose books were translated into Finnish and who was an invited lecturer of Finnish regional and innovation policy actors.

A regional dimension of innovation matters exists in the nationally-designed innovation and regional policies in Finland. As mentioned, in the design of the national innovation system, attention has been paid to regionalising it since the early 1990s. Practices for a regionally networked innovation system (see ASHEIM & GERTLER, 2005) have also emerged. The contemporary regional policy is a programme-based policy for strengthening the competitiveness and learning capacity of each region, maintaining a balanced regional structure and safeguarding a service structure everywhere (REGIONAL DEVELOPMENT ACT, 2002). There are four major regional policy programmes, of which two are more traditional (the Rural Policy Programme, the Island Development Programme) and two (the Centres of Expertise and the Regional Centres Development programmes) are more innovation-oriented.

Although simple in strategies, successful convergence of the regional and innovation policies is difficult in practice. In Finland, the Ministry of the Interior in co-operation with other ministries and regional councils is responsible for the formulation of national targets for regional development that the national government decides on. The seventh regional development law (2002) focuses on strengthening the competitiveness of the regions. The national government's first regional development target indicates this well, namely improving the competitiveness of regions in the global market by strengthening specialisation and promoting the information society (OECD, 2005, 44–45). The guidelines are designed to strengthen the regional innovation policy, support the use of expertise outside regional centres and allow the whole country to make use of funding allocated to technology and expertise (MINISTRY OF INTERIOR, 2005b). These tasks

and guidelines are again an endeavour towards regionalising the national innovation system.

In the implementation of innovation-related policies, the smallness of Finland matters. Resources for basic and applied research are tight, the amount of key experts of core technologies is rather small and the variety of social capital is limited. At the same time, the national innovation system internationalises in an open society such as Finland. Studying the Nordic countries, Hanell *et al*. (2002) noted how regional policy is diverging into regional cohesion policy and regional development policy. The former enhances welfare and resource redistribution, favouring less-developed regions, and the latter promotes economic growth across all parts of the country (OECD, 2005, 104). However, this divergence is stronger in Finland after competitiveness became the fundamental task. Goddard *et al*. (2003, 29) claim that the strong national focus on the innovation system means Finland has one national innovation system and several local systems, but no true regional innovation systems.

Centres of Expertise Programme

The most significant example of convergence of the regional and innovation policies in Finland is the Centres of Expertise Programme (CEP) launched in the mid-1990s. Since 1994 the number of Centres of Expertise (CoE) has varied from 8 to 22, covering all regions of Finland (Figure 2). The CEP has become an actor that implements regional innovation and industrial policies (*HUIPPUOSAAMISESTA* … 2003, 8, 21). The idea of

the programme was discussed already in the mid-1980s, and it was officially proposed in 1991 by Anssi Paasivirta (1991, 82–84, 101, 154), the appointed evaluator of the Finnish regional policy. He proposed that the key Finnish urban agglomerations should be developed into locations for internationally competitive enterprise activities. To accomplish this there was a need for universities, technology centres, enterprises, information and communication technology projects, high-quality living environments, provision of services in English, international marketing of the expertise centres, etc. (LIEVONEN & LEMOLA, 2004, 106).

The CEP focuses on a few growing urban agglomerations with universities, specialised research institutes and a stock of related industries. In the early 2000s the CEP included 18 localities and 45 fields of expertise focused on internationally competitive activities. Despite Finland's success in ICT, only three CoEs dealt precisely with ICT. In 2007–2013 the number of CoEs was 21, with 13 clusters. Besides health, welfare, environmental and energy technologies, thematic fields include tourism, experience industry, nano- and microsystems and future materials, intelligent machines, forest industry future, housing, food, sea, etc. Some fields are based on immobile localised capacities, but often the aim is to promote public-private innovation-supportive co-operation. National funding for the CEP in 2006 was 8.2 million euros (MINISTRY OF THE INTERIOR, 2006).

The CEP pools local, regional and national resources to utilise world-class expertise in selected, internationally competitive fields in the region. New knowledge-intensive

business is created to improve the competitiveness of enterprises. According to the Ministry of the Interior (2005), the CEP fosters regional strengths, specialisation and co-operation between the various CoEs. The CoEs "establish the prerequisites for the creation and commercialisation of innovation; launch co-operative projects between the research sectors and industries; continuously strengthen and modernise top-level expertise in the region; and promote the development of creative and innovative environments." The CEP can be defined as a programme-based national regional policy that focuses on innovations in accordance with the regional development law.

The CEP is heavily based on public knowledge generation and exploitation institutions. It utilises international high-level knowledge and expertise for entrepreneurial activities, improves development resources, and creates new employment opportunities in the regions. Such expertise is based on strong, developing research, education and business activities located in the region, including product and service innovations. In regional development the CEP helps localities to make strategic choices in innovation policy (*HUIPPUOSAAMISESTA*..., 2003). In addition, the CoEs help the regions to exploit national and EU R&D resources. By doing this the CEP supports the formation of an institutional regional innovation system (see COOKE, 2004, 4).

The central authorities provide the basic public funding for the CEP. In 1994–1998, public state funding for the programme was 14 million euros. In 1999–2002, 903 projects were carried out within the programme, with total funding of 148.7 million euros, of which basic state funding was 20 million (*HUIPPUOSAAMISTA*..., 2003). The

CoEs use the latter funding to co-ordinate programmes, prepare projects and provide spearhead projects with seed-stage funding. The requirement for receiving basic state funding is that the regions also contribute to financing. Based on the proposal submitted by the committee, the national government decides on how to regionally allocate basic CEP funding.

The CEP has been received positively by the national government, the European Commission and many EU member states (MANNINEN, 2004). Despite the general positive evaluation of the CEP (*HUIPPUOSAAMISTA*…2003), Kauppinen & Karhu (2002, 274) state that in the short run, the growth centres are unable to spread positive spill-over effects to surrounding areas. In addition, the earlier large number of CoEs meant that only a few of them have had an internationally competitive knowledge base and enterprises (PIKKUJÄMSÄ *ET AL.*, 2005). In fact, the early stage of the CEP seems have relied on a territorially embedded innovation system. Expansion of the CEP in the early 2000s seemed to rely on the idea that this embedded and localised innovation system could be integrated into the national innovation system. The results from 1999 – 2006 indicate that with the CEP was generated 13,000 new jobs, 29,300 jobs were maintained and 1,300 new enterprises emerged (MINISTRY OF THE INTERIOR, 2006). The reform of the CEP for the period 2007–2013 means that this integration was not successful enough. However, since the selection of CoEs for the CEP is based on competitive bids by the localities, the national authorities still have the aim that each selected CoE supports national competitiveness and is integrated into the national innovation system. Bidding and selection is also a way to promote desired institutional

learning in the localities and allow national authorities to hold a significant position in enabling and constraining regional formation of an innovation system. However, party politics is involved in the selection, so the number of CoEs is higher than their performance.

Regional Centre Programme

The CEP is deliberately targeted towards a few larger urban agglomerations, so the broader national regional policy goals demand an additional policy tool to further regionalise innovation-related activities. To focus on smaller regional centres with lower innovation capabilities, the national government launched the Regional Centre Programme (RCP) in 2001 in accordance with the seventh regional development law. The RCP aims to develop a balanced network of regional centres in every Finnish region, enhance the international competitiveness and innovativeness of Finland and its regions, and use all available resources efficiently (MINISTRY OF THE INTERIOR, 2005). The total funding for the RCP was 8.34 million euros, i.e. on average under 300,000 per regional centre in 2005.

The RCP is implemented in 35 urban regions with 257 municipalities, which provide service and employment for their immediate hinterland (Figure 2). Most localities are small, creating a particular need to focus on their strengths, expertise and specialisation. The RCP has five roles, depending on the sub-regional characteristics and the

implementation method of the programme. Firstly, the RCP as a *strategic* umbrella means systematically and simultaneously focusing on several development aspects. Secondly, the RCP as a *promoter of sub-regionalism* means strengthening the sub-regional co-operation structures and modes. Thirdly, as an *extensive programme* the RCP is implemented broadly to enhance the added value of the region by co-ordinating functions and projects. Fourthly, the *new development aspect* signifies that the RCP's goal is to generate a new field of industry and expertise in a region with already existing strong sectors. Fifthly, the RCP is also an *additional instrument and resource* for other regional development work (MINISTRY OF THE INTERIOR, 2005). The goals for the period 2007–2010 emphasise enterprise-led development strategies, specialisation, creation of an attractive environment for innovations and action, enhancement of national and regional innovation tools and modes and partnership between the public and private sectors and within the public sector at various spatial levels. National funding for the RCP for 2007 is 8.0 million euros (*ALUEKESKUSOHJELMA*… 2006).

The RCP has been criticised. According to the evaluations, the central themes in 2001–2005 were closer sub-regional co-operation, commitment of the municipalities and partnership between central co-operators, regional councils and regional administrative authorities. The RCP intensified the formation of regional co-operation strategies and co-operation among the public sector authorities in selected urban regions. Networking has been limited in some regional centres, but in others co-operation between enterprises, research and education organisation has increased. In general, networking with the surrounding region has been poor. It seems that the national authorities have

tried with the RCP to facilitate the transformation from a territorially embedded to a regionally networked innovation system. Another criticism is the vagueness in promoting the real innovation potential of regional centres. The RCP has not been able to facilitate key strategic selections of the involved localities to deviate from the lock-ins of negative path dependency and to promote added value in innovation-oriented institutional learning. This is partly due to small programme funding. However, it is impossible to know the impact of the RCP exactly, because there are many other similar development programmes taking place (VIRTANEN & VALOVIRTA, 2004, 61–62; MINISTRY OF THE INTERIOR, 2005a; OECD, 2005; *ALUEKESKUSOHJELMAN*… 2006).

In the early 2000s several localities took part simultaneously in the CEP and the RCP, resulting in overlapping and confusion, project mismatching and wasting of resources (VIRTANEN & VALOVIRTA, 2004, 61–62). In 2007 the RCP has more national orientation in its co-operation activities. However, such a focus is a challenge to creating long-term employment growth based on competitive innovations. Also, networking of localised innovation capacities is even more challenged due to the heated debate regarding on-going municipal reform in which the national authorities are pushing towards territorial amalgamation based on the daily labour area. This has destroyed some started co-operation practices of the RCP.

Multipolis project

In the early 2000s there were seven centres of the RCP and three of the CEP in northern Finland, which is a very challenging area in terms of innovation and high technology. It covers a territory of 155,100 square kilometres, with 0.7 million inhabitants, i.e. on average 4.6 persons per square kilometre. The only major functional urban region (FUR), Oulu, has 210,000 inhabitants, and population growth is concentrated there (+22.9 % in 1990–2005). In addition, the Oulu FUR is the only area in which the number of jobs has grown since 1990. The most declined areas lost almost every fourth person and more than every third job in the same period. Northern Finland has two universities and five universities of applied sciences, with 38,000 students (MINISTRY OF EDUCATION, 2005; STATISTICS FINLAND, 2006b). The area hosts very few specialists, a very small local market and long distances between regional economic development actors.

One CEP centre is the Centre of Expertise of the Oulu Region (CEOR). It focuses on information technology and wellness technology, strengthening the Oulu FUR internationally in these fields. Information technology includes telecommunications, electronics, software, content production and media, with 10,900 jobs and 274 companies with a total annual turnover of 4,200 million euros in the region. Wellness technology consists of medical technology, biotechnology and environmental technology, with 6,400 jobs and 214 companies with a total annual turnover of 660 million euros in the area (CITY OF OULU, 2006).

The CEOR is a spatially tightly networked regional innovation system (see COOKE, 2004, 14) encompassing local, regional, national and supranational levels. Competence in the Oulu area comes from both basic and applied research in the public and private sectors, including the large research centre of Nokia. The co-operation of the innovation system is active and there are many stakeholders involved, such as associations, a development forum and industry clubs. Funding originates from government agencies, enterprises, banks and venture capitalists through various agreements, such as the Oulu Growth Agreement (OGA). The OGA was a voluntary measure and regional strategy for 2000–2006 with the aim of promoting spearhead projects amounting to 300 million euros for growth in employment (+6,000 jobs) and turnover (+1,500 million Euro) in five technology fields. The agreement was signed by all the major actors in the Oulu area (CITY OF OULU, 2006). However, the national downturn in ICT in the early 2000s and problems in successful project internationalisation meant that the goals were not fully achieved.

In addition, since 2000 the CEOR has funded and promoted a spatially wider regional innovation system, the Multipolis project. Multipolis connects high technology enterprises, regional developers, and higher education and research institutes located all around northern Finland (Figure 2). There are 137 high technology enterprises and 116 other enterprises outside the Oulu area, mostly located as clusters in technology centres in 14 localities. The goal of Multipolis is to maximise the utilisation of technological know-how in northern Finland and to expand the technology-related expertise and knowledge of the Oulu FUR to elsewhere in the north. The concrete aim set in 2000 was

to improve the competitiveness and knowledge-base of technology enterprises and to create 15,500 new jobs in high technology (MULTIPOLIS, 2004).

Multipolis is a project set up to regionalise the national innovation system by focusing on high technology, which is one key national economic cluster. Many public and private actors of the national innovation system are involved in the strategic and operational implementation of the project – from funding to administration. They address Multipolis as a tool for sharpening existing key technologies to make them globally competitive and commercially viable. However, some regional and local authorities in northern Finland see Multipolis as a traditional regional policy tool for promoting employment in the localities in which it is implemented (JAUHIAINEN, 2006).

Multipolis as a policy initiative has been received positively by the national government and the European Commission, and there are plans to implement the concept also elsewhere in Finland (MANNINEN, 2004). The very idea is promising: a high technology network in a peripheral area that simultaneously raises national competitiveness and creates local employment. However, studied in detail, quite a few enterprises involved in the Multipolis project have received poor benefits from it. Most enterprises saw Multipolis as very important or important as a channel for new information, as a social network and for co-operation with other enterprises (JAUHIAINEN, 2006). The impact on turnover, employment and competitiveness is much smaller than planned. In fact, in 2006 the employment growth target was reduced

to one tenth of the original. It is very difficult to simultaneously regionalise an innovation system by supporting its internationalisation and global competitiveness and maintain the traditional aims of welfare distribution of the Finnish regional policy within the same project. Even trying seems to flatten the results, as Multipolis indicates.

Figure 2. Main innovation-related regional policy initiatives in Finland in 2007.

CONCLUSIONS

Innovations are crucial for countries that cannot compete with low labour and production costs or with a large domestic market. Finland is such a country: small in population and natural resources and geographically peripheral. Nevertheless, in several international rankings Finland's economy is among the most competitive. The conventional explanation is the early emphasis on a national innovation system and policies, significant investment in high technology R&D and constant improvement of the comprehensive education system. In all, Finland has been receptive to regional and innovation theories from the 1960s growth pole and regional welfare policies to the more recent cluster and regional innovation systems. The country followed these policy trends until the 1980s, but nowadays many claim that Finland is a trend-setter in current regional (and) innovation policy practice.

In fact, Finland took early moves towards a comprehensive innovation policy. The contemporary keywords of innovation, technology, knowledge and competitiveness appeared in the annual reports of the main internationalising Finnish enterprises in the 1980s, and they were subsequently used in the national government's statements and guidelines for development policy (KANTOLA, 2006). The Finnish innovation policy was organised in the early 1990s, leaning on the Lundvallian concept of a national innovation system and on the Porterian cluster model covering the whole country (LEMOLA 2003, 82, 89). The policy was based on a systematic review of these concepts and models and it was formulated even before or simultaneously with the publication of Porter's (1990), Lundvall's (1992) and Nelson's (1993) key books. In the early 1990s attention was also paid to regional clusters in the national innovation system. The design of the Centres of Expertise programme, the most well-known Finnish tool of regional innovation policy, was influenced by the prominent concepts and theories of the mid-1980s as well as the early development of the information and communication technology sector in Finland. The national innovation policy and regionalised innovation system were implemented from the early 1990s onwards.

From the national perspective, Finland is now on the watershed between past legacies and future alternatives. Traditionally, regional policy in Finland supports populating of the entire country by providing equal access to welfare regardless of local resources. Such a tradition has its roots in the early 20th century, in safeguarding the eastern border against a possible enemy, in exploiting the few natural resources available, such as forest and water power, and in unifying the Finns among themselves and to the national

territory. During the past ten years new national innovation and regional policies have been implemented in Finland under globalisation. The Centres of Expertise and the Regional Centres programmes promote the integration of regional clusters into the national innovation system while promoting necessary innovation-supportive interaction within the localities, and opening development into the global economy. In the new national policies one can find a continuation of the idea of using all national resources for the development of Finland. In the new context these resources are knowledge and technology.

So far, the regional, innovation and information society policies pronounce the traditional goals of a balanced regional structure. However, the population, employment and R&D trends indicate a divergence in regional cohesion instead of balance throughout the country. In practice, there are very few growth areas in Finland (globally competitive large urban agglomerations), a few areas of potential modest growth or decline (regional centres) and many declining areas (the rest of the country). Simultaneous implementation of the traditional distributive welfare policy and the new competitiveness policy goals easily leads to a policy mismatch at the local level, as indicated with the case of Multipolis. To be efficient, such a network must focus on very few, key special technologies. Less developed areas have serious challenges in this respect due to lacking competencies. In addition, because global trends vary very rapidly and competition is increasing, concentration on globally-oriented high technology makes the localities vulnerable.

In a short article it is not possible fully explore how much the Finnish innovation policy and its regionalisation followed a logically planned path. One has to more deeply consider the particularities of internal and external contexts and the persons involved in the decision-making, trials and errors. Obviously, the prevailing way to narrate the Finnish story is to stress the proactive approach and logical selection instead of uncertain trials, errors and coincidence (but, see MIETTINEN, 2002). Policymakers easily see themselves as crucial in enabling social institutions to be characterised by institutional learning and in favouring organisational capacities that intertwine the key actors of innovation. However, the private sector also played an important role, especially the leading enterprises involved in technology. There is much to learn from the evolution of the Finnish regional and innovation policies, but one has to deconstruct their trajectory before implementing them elsewhere. The current strategy and implementation do not necessarily prevent future lock-ins. In a global economy past success does not guarantee the future, so uncritical copying of the Finnish model definitely would lead to a mismatch.

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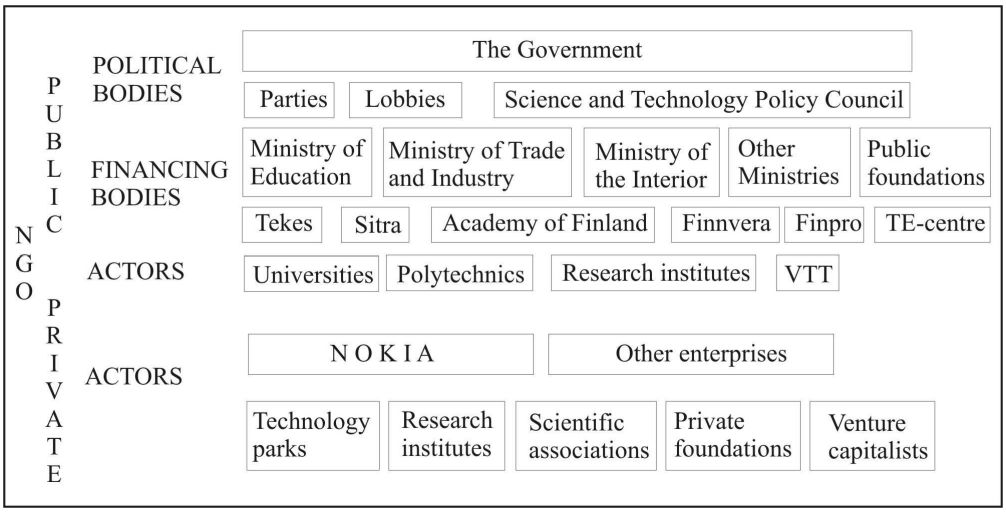

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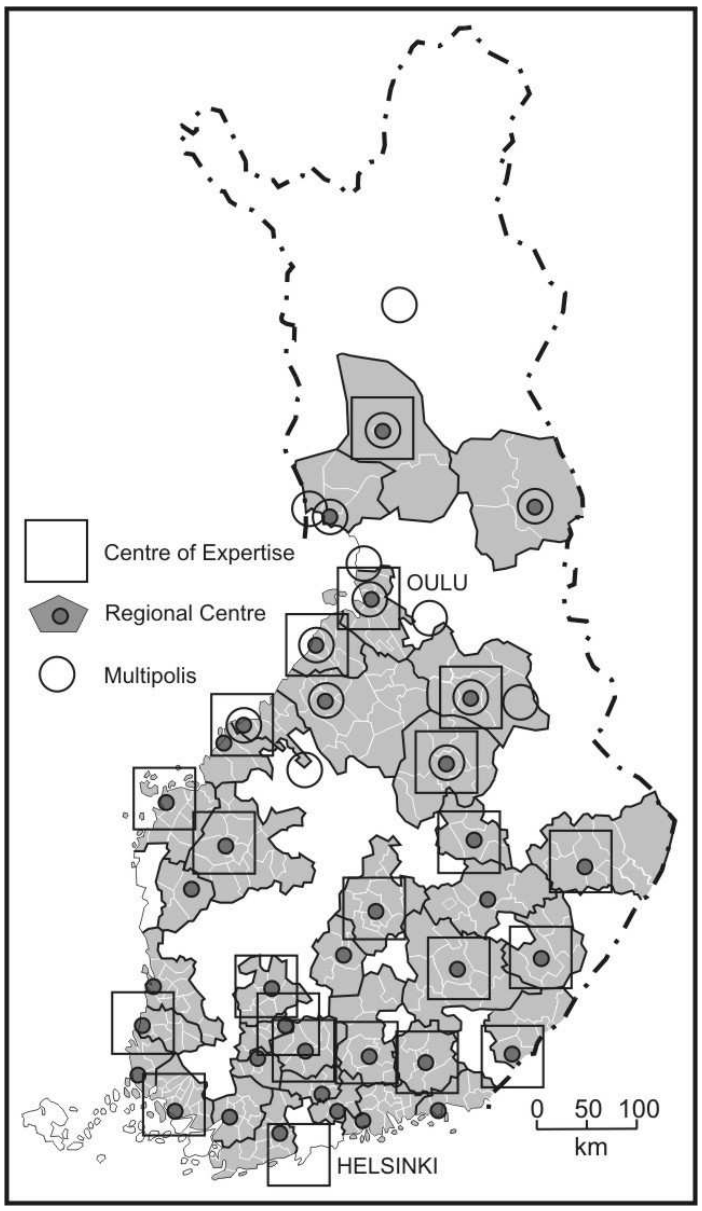

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